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(74) Agents: QUINE, Jonathan, Alan et al.; Quine Intellectual Property Law Group, P.C., P.O. Box 458, Alameda, CA 94501 (US).

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(71) Applicant (for all designated States except US): **THE SCRIPPS RESEARCH INSTITUTE** [US/US]; 10550 North Torrey Pines Road, La Jolla, CA 92037 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ANDERSON, J., Christopher** [US/US]; 124 Mason St., Apt. 401, San Francisco, CA 94102 (US). **WU, Ning.** [CN/US]; 116 Centre Street, Brookline, MA 02138 (US). **SANTORO, Stephen** [US/US]; 1697 Cambridge Street #15, Cambridge, MA 02138 (US). **SCHULTZ, Peter, G.** [US/US]; 1650 La Jolla Rancho Road, La Jolla, CA 92037 (US).

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(54) Title: COMPOSITIONS OF ORTHOGONAL LYSYL-TRNA AND AMINOACYL-TRNA SYNTHETASE PAIRS AND USES THEREOF

(57) Abstract: Compositions and methods of producing components of protein biosynthetic machinery that include orthogonal lysyl-tRNAs, orthogonal lysyl-aminoacyl-tRNA synthetases, and orthogonal pairs of lysyl-tRNAs/synthetases, which incorporate homoglutamines into proteins are provided in response to a four base codon. Methods for identifying these orthogonal pairs are also provided along with methods of producing proteins with homoglutamines using these orthogonal pairs.

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